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(54) **OPTICAL MULTILAYER INFORMATION CARRIER**
OPTISCHER MEHRSCICHT-INFORMATIONSTRÄGER
SUPPORT D'INFORMATION MULTICOUCHE OPTIQUE

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• **VOS, Gerardus, Johannes, Josephus**
NL-5656 AA Eindhoven (NL)

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(74) Representative: **Faessen, Louis Marie Hubertus**
INTERNATIONAAL OCTROOIBUREAU B.V.,
Prof. Holstlaan 6
5656 AA Eindhoven (NL)

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(73) Proprietor: **Koninklijke Philips Electronics N.V.**
5621 BA Eindhoven (NL)

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EP-A- 0 520 619 EP-A- 0 737 966
EP-A- 0 745 985 DE-A- 19 607 169
GB-A- 2 017 379

(72) Inventors:
• **BRAAT, Josephus, Johannes, Maria**
NL-5656 AA Eindhoven (NL)

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Description

[0001] The invention relates to an information carrier comprising a substrate and information layers having optically readable effects which effects represent information, which information layers comprise a standard layer having effects of standard information density readable by an optical beam formed by light of a first wavelength, the beam, upon reading, entering on an entrance side of the substrate, the standard layer being located opposite the entrance side, and a high-density layer having effects of high information density, the high-density layer being substantially transparent to the optical beam of the first wavelength, the high-density layer being at least partially reflective to light of a second wavelength suitable for reading effects of high information density.

[0002] Such a multi-layer information carrier is known from EP-0 520 619. The described optical recording medium comprises two recording layers located on one side of a substrate to be read by a beam of light entering the substrate from the other side called the entrance side of the substrate. The first recording layer is reflective to light of a first wavelength and transparent to light of a second wavelength and the second recording layer is reflective to the light of the second wavelength. Information can be read from a layer through the substrate by focussing a beam of an appropriate wavelength on the respective layer, scanning the effects and transforming the reflected light into a read signal. The information is recovered from the read signal by detecting the changing of an optical characteristic of the reflected light. A recorded layer comprises either standard-density or high-density optically readable effects. A problem of the known disc is, that during reading the second layer there is a disturbance in the read signal caused by the first layer, which has to be passed twice by the beam. This may cause errors in the recovered information.

[0003] It is an object of the invention to provide an information carrier in which, upon reading, the quality of the read signal is improved. For this purpose, the information carrier according to the invention is characterized as described in claim 1 for each of the respective member states as indicated. This has the advantage that the read signal when reading the standard layer is less disturbed. There is a balance between decreasing the disturbing effects when reading the standard layer and increasing the disturbance from dust and surface defects when reading the high-density layer. A further advantage of a distance substantially equal to half the distance between the standard layer and the entrance side is that when manufacturing the information carrier, two substrate layers of the same thickness supporting the information layers are to be processed.

[0004] The invention is also based also on the following recognition. While reading the standard layer the optical beam has a larger diameter when passing a high-density layer spaced apart compared to the diameter

when using a set of layers spaced closely on one side of the substrate. The irregularities in the high-density layer, such as recorded effects, repetitively recorded data or header patterns, will hardly affect the read signal. However the read signal from the high density layer may be impaired by dust particles and scratches on the surface for the same reason. So the high density layer should be located closer to the entrance side, but not too close to prevent impairment by dust, etc.

[0005] A further advantage is a better quality of the read signal when reading the high-density layer. The size of the spot as focussed on a layer is a function of the wavelength of the optical beam and the NA (numeric aperture) of the focussing lens. However, if the NA is increased to decrease the spot size, it is necessary to reduce the substrate thickness in order to reduce the influence of disc tilt on the quality of the radiation beam. A smaller spot results in less interference from adjacent effects and a better read signal. Alternatively, a higher information density (using the same wavelength and the same optical requirements) may be attained, because a reduced-size scanning spot allows smaller effects to be used, e.g. smaller pits in tracks with a smaller track pitch. A further advantage of the greater distance between the standard layer and the high-density layer is, that players not arranged for playing multi-layer records, are less likely to be disturbed by the other layer, e.g. may in error try focussing their beam on the wrong layer. This applies for example to a standard CD player reading the standard layer and to a high-density player not arranged for discriminating between layers and therefore only reading the high-density layer. Also portable players, when subject to shocks, will less likely focus on a wrong layer.

[0006] An embodiment of the information carrier is characterized in that the distance between the standard layer and the entrance side is about 1.2 mm. This has the advantage, that a disc according to the CD standard can be formed, being playable on standard CD players and on high-density players.

[0007] An embodiment of the information carrier is characterized in that the high-density layer is partly transmissive to light of the second wavelength enabling the standard layer to be scanned. This has the advantage, that a high-density player may be arranged for reading the standard layer.

[0008] An embodiment of the information carrier is characterized in that the high-density layer is substantially fully reflective to light of the second wavelength. This has the advantage, that a high-density player not being arranged for reading the standard layer, will not be disturbed by the presence of the standard layer, as this layer is substantially invisible at the second wavelength.

[0009] An embodiment of the information carrier is characterized in that the high-density layer accommodates amongst other things the same information as the standard layer. This has the advantage, that there is no

need for a high-density player to change layers when using the information.

[0010] An embodiment of the information carrier is characterized in that the high-density layer accommodates information recorded in the standard layer which information is coded differently from the information in the standard layer. This has the advantage that while a standard player can present certain information, an improved version of the same information can be presented by the high-density player.

[0011] An embodiment of the information carrier is characterized in that the information carrier comprises two substrate layers separated by a bonding agent, the substrate layers each supporting an information layer. This has the advantage, that each substrate supports an information layer and can be processed separately, e.g. optical readable effects can be pressed in both substrates. The information carrier is easily formed by finally bonding the two sections together.

[0012] It is noted that EP 0 745 985 describes a record carrier having a low density layer and a high density layer at a substantial distance. However, this document is considered relevant for DE FR and GB for novelty only pursuant to Art 54(3) and (4) EPC. The document describes (column 4, lines 15-21) that software which can be played back at high resolution can be recorded on the first information recording layer, which has a high recording density, and the same software can be recorded at low resolution onto the second information recording layer, which has a low recording density. The document does not describe storing a surround sound version of information already recorded in the standard layer; or adding other extensions to the same information in the high density layer.

[0013] Further it is noted that DE 19607169 describes a record carrier having a low density layer and a high density layer at a substantial distance. However, this document is considered relevant for DE for novelty only pursuant to Art 139(2) and Rule 87 EPC. The document describes that same information may be recorded in different formats, or that the low density layer may have the soundtrack of a movie stored in the high density layer (column 5, line 54 to column 6, line 23). The document does not describe storing a surround sound version of information recorded in the standard layer in the high density layer.

[0014] These and other aspects of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter.

[0015] In the drawings:

Fig. 1 shows the layer structure of a new information carrier,

Fig. 2 shows an information carrier with a beam of a standard CD player, and

Fig. 3 shows an information carrier with a beam of a HD player.

[0016] Figure 1 shows an information carrier according to the invention. The carrier may be disc-shaped like the known audio CD, but may be shaped alternatively like optical tape or card. A description of the standard CD can be found in the title "Principles of optical disc systems" by Bouwhuis et al. ISBN 0-85274-785-3. The information carrier according to the invention comprises a first substrate layer 5 which accommodates at least one high-density information layer 3. The high-density information layer 3 is substantially transparent to a first wavelength, e.g. infrared radiation (for example, $\lambda = 780$ nm), but shows at least partially reflection for a second, shorter, wavelength, e.g. red laser radiation (for example, $\lambda = 635$ nm). The high-density layer 3 comprises optically readable effects 7 of a high-density. The effects may be bumps or pits or other optically detectable effects, for example like phase change or MO (magneto optical) recording. Subsequently, the first substrate 5 is followed by a second substrate 4 on which a standard density information layer 2 is provided. The standard density layer 2 comprises optically readable effects 6 of a low density having relatively large dimensions. The substrates together provide the mechanical stiffness of the information carrier as a whole, although not necessarily in equal amounts. The total structure has a relatively large distance between high-density and standard layer, compared to the known multilayer structure of EP 0520619. The information layers are to be scanned by an optical beam entering through the first substrate (from the bottom side in figure 1). When scanning the high density layer with a beam of radiation of the second wavelength sufficient radiation is reflected for detecting the effects of the high-density layer. When scanning the standard density layer with a beam of radiation of the first wavelength substantially all radiation, e.g. 70 %, is reflected for detecting the effects of the standard layer. In scanning the standard layer the beam of the first wavelength passes the high-density layer twice and it may be reflected for a small portion by the high density layer. However, as there is a relative large distance between the focal plane and the high-density layer, irregularities such as recorded effects, header patterns or repetitive data patterns are hardly affecting the reflected radiation, as they are averaged out by the relatively large diameter of the beam when crossing the layer on a large distance from the focal plane. Moreover, players arranged only for reading a standard information layer on a specific depth, such as CD players for CD with a substrate thickness of 1.2 mm, are not affected in their operation if a minimum distance is kept between the layers of about $300 \mu\text{m}$, i.e. 25%, of the total substrate thickness. However the distance between the high density layer and the entrance side of the substrate must be a minimal value H for limiting the adverse effects of dust particles and fingerprints on the surface. It has been found, that the safe minimal value H is dependent on the NA (numerical aperture of the focusing lens), and can be expressed as $H > 84/\text{NA}$. For a NA of 0.6 a min-

imal value H of $140\text{ }\mu\text{m}$ is found. For a disc compatible to the CD the high-density layer or layers should therefore have a distance between $140\text{ }\mu\text{m}$ and $900\text{ }\mu\text{m}$ from the entrance side, i.e. between circa 10% and 70% of the total substrate thickness.

[0017] An embodiment of the information carrier according to the invention has the high-density layer substantially halfway between the entrance side and the standard layer. This has been found to be a good compromise between the need to increase the distance between the standard layer and the high-density layer and the need to keep the distance between the surface of the substrate at the entrance side and the high density layer as large as possible.

[0018] An embodiment of the information carrier according to the invention has a total thickness of the two carrier substrates of about 1.2 mm, the standardized substrate thickness for CD discs. The standard density layer is a CD information layer and comprises a highly reflective mirror layer that properly reflects both infrared and red laser radiation and meets the minimum reflection requirement for CD with $\lambda \approx 800\text{ nm}$, i.e. 70%. A well-known material for the mirror layer is Aluminium. In combination with the previous embodiment an information carrier comprises two substrate layers of about $600\text{ }\mu\text{m}$ thickness (practical range of $500\text{--}700\text{ }\mu\text{m}$).

[0019] Figure 2 shows the disc with a beam 8 having a first wavelength, e.g. of a standard CD player. This beam 8 hits the standard layer 2 and is substantially not impeded by the high-density layer or layers 3.

[0020] Figure 3 shows the disc with a beam 9 of a high-density player having a second wavelength shorter than the first wavelength. The beam 9 hits the high-density layer 3.

[0021] In an embodiment of the disc the high density layer is substantially fully reflective to the radiation of the second wavelength. In this case the disc appears to a high-density player as a 'high-density only' disc, as the standard density layer cannot be scanned by the beam of the second (shorter) wavelength. The disc can therefore be played by a 'single-layer only' high density player, as no special measures are necessary to focus on or scan the high-density layer.

[0022] In an embodiment of the disc the high density layer is partially transmissive to the radiation of the second wavelength. In this case it is possible to read all the information layers by focusing on the respective layers. An embodiment of a high-density player that implements such a reading method is disclosed in EP-A-95200619.5 (PHN 15.252). Moreover, the standard information layer having CD density can be read out on a standard CD player without encountering difficulties, provided that the intermediate high-density information layer(s) are sufficiently "invisible" by a low reflection for the first wavelength used by standard CD players. In practice, 70% of the incident light should be returning to a detector reflected by the standard density layer.

[0023] In an embodiment of the disc the high density

layer accommodates amongst other things the same information as the standard layer. An example is a CD-ROM, in which the standard layer comprises a basic version of a software package for use on PC's and in which the high-density layer comprises the same software, but also a lot of extensions and additional data-files. A versatile PC with a high-density reader doesn't need to switch between layers, but uses the full-fledged high density version of the software. Another example is an opera with audio only on the standard layer and audio and video on the high density layer.

[0024] In an embodiment of the disc the high-density layer accommodates information recorded in the standard layer which information is coded differently from the information in the standard layer. Such a disc comprises certain information, e.g. a musical piece coded in standard CD audio quality on the standard density layer. For high-end audio fans an improved version of the same information is recorded on the high-density layer, e.g. a surround sound version or higher resolution version of the same musical piece.

[0025] In an embodiment of the disc the information carrier comprises two substrate layers separated by a bonding agent, the substrate layers each supporting an information layer. Each substrate layer has been pressed in a mould and is provided with a respective information layer. The information carrier is formed by bonding the two substrates together by a bonding agent. The bonding agent may also have the function of (at least partially) reflective layer, or the reflective function may be realized by a separate layer applied on the substrate layer beforehand. An embodiment of the disc according to the invention comprises several high density layers. For example one high-density layer may be pressed on the top side of the first substrate 5 and a second high-density layer may be pressed on the bottom side of the second substrate 4. The top side of the second substrate is provided with the standard density layer. Both substrates should be separated by a thin support layer, e.g. the bonding agent. While scanning as shown in figure 3 the beam 9 having the second (shorter) wavelength must be focused on one of the high density layers 3.

Claims

Claims for the following Contracting States : BE, ES, GR, IT, NL, PT

1. Information carrier comprising a substrate and information layers having optically readable effects which effects represent information, which information layers comprise a standard layer (2) having effects of standard information density readable by an optical beam (8) formed by light of a first wavelength, the beam, upon reading, entering on an en-

trance side of the substrate, the standard layer (2) being located opposite the entrance side, and a high-density layer (3) having effects of high information density, the high-density layer (3) being substantially transparent to the optical beam (8) of the first wavelength, the high-density layer (3) being at least partially reflective to light (9) of a second wavelength suitable for reading effects of high information density, **characterized in that** the distance between the high-density layer (3) and the entrance side is substantially equal to half or less the distance between the standard layer (2) and the entrance side.

2. Information carrier as claimed in Claim 1, **characterized in that** the distance between the standard layer (2) and the entrance side is about 1.2 mm.
3. Information carrier as claimed in Claim 1 or 2, **characterized in that** the high-density layer (3) is partly transmissive to light of the second wavelength enabling the standard layer (2) to be scanned.
4. Information carrier as claimed in Claim 1 or 2, **characterized in that** the high-density layer (3) is substantially fully reflective to light of the second wavelength.
5. Information carrier as claimed in one of the preceding Claims, **characterized in that** the high-density layer (3) accommodates amongst other things the same information as the standard layer (2).
6. Information carrier as claimed in Claim 1, 2, 3, 4 or 5, **characterized in that** the high-density layer (3) accommodates information recorded in the standard layer (2) which information is coded differently from the information in the standard layer (2).
7. Information carrier as claimed in one of the preceding Claims, **characterized in that** the information carrier comprises two substrate layers separated by a bonding agent, the substrate layers each supporting an information layer.

Claims for the following Contracting State : DE

1. Information carrier comprising a substrate and information layers having optically readable effects which effects represent information, which information layers comprise a standard layer (2) having effects of standard information density readable by an optical beam (8) formed by light of a first wavelength, the beam, upon reading, entering on an entrance side of the substrate, the standard layer (2) being located opposite the entrance side, and a high-density layer (3) having effects of high information density, the high-density layer (3) being substantially transparent to the optical beam (8) of the first wavelength, the high-density layer (3) being at least partially reflective to light (9) of a second wavelength suitable for reading effects of high information density, the distance between the high-density layer (3) and the entrance side being substantially

mation density, the high-density layer (3) being substantially transparent to the optical beam (8) of the first wavelength, the high-density layer (3) being at least partially reflective to light (9) of a second wavelength suitable for reading effects of high information density, the distance between the high-density layer (3) and the entrance side being substantially equal to half or less the distance between the standard layer (2) and the entrance side, **characterized in that** the high-density layer (3) accommodates a surround sound version of information recorded also in the standard layer (2).

2. Information carrier as claimed in Claim 1, **characterized in that** the distance between the standard layer (2) and the entrance side is about 1.2 mm.
3. Information carrier as claimed in Claim 1 or 2, **characterized in that** the high-density layer (3) is partly transmissive to light of the second wavelength enabling the standard layer (2) to be scanned.
4. Information carrier as claimed in Claim 1 or 2, **characterized in that** the high-density layer (3) is substantially fully reflective to light of the second wavelength.
5. Information carrier as claimed in one of the preceding Claims, **characterized in that** the high-density layer (3) accommodates amongst other things the same information as the standard layer (2).
6. Information carrier as claimed in one of the preceding Claims, **characterized in that** the information carrier comprises two substrate layers separated by a bonding agent, the substrate layers each supporting an information layer.

Claims for the following Contracting States : FR, GB

1. Information carrier comprising a substrate and information layers having optically readable effects which effects represent information, which information layers comprise a standard layer (2) having effects of standard information density readable by an optical beam (8) formed by light of a first wavelength, the beam, upon reading, entering on an entrance side of the substrate, the standard layer (2) being located opposite the entrance side, and a high-density layer (3) having effects of high information density, the high-density layer (3) being substantially transparent to the optical beam (8) of the first wavelength, the high-density layer (3) being at least partially reflective to light (9) of a second wavelength suitable for reading effects of high information density, the distance between the high-density layer (3) and the entrance side being substantially

equal to half or less the distance between the standard layer (2) and the entrance side, **characterized in that** the high-density layer (3) accommodates amongst other things the same information as the standard layer (2), the other things comprising extensions to said same information.

2. Information carrier as claimed in claim 1, **characterized in that** said extensions comprise a surround sound version of information recorded also in the standard layer (2).
3. Information carrier as claimed in Claim 1 or 2, **characterized in that** the distance between the standard layer (2) and the entrance side is about 1.2 mm.
4. Information carrier as claimed in Claim 1 or 2, **characterized in that** the high-density layer (3) is partly transmissive to light of the second wavelength enabling the standard layer (2) to be scanned.
5. Information carrier as claimed in Claim 1 or 2, **characterized in that** the high-density layer (3) is substantially fully reflective to light of the second wavelength.
6. Information carrier as claimed in Claim 1, 2, 3, 4 or 5, **characterized in that** the high-density layer (3) accommodates information recorded in the standard layer (2) which information is coded differently from the information in the standard layer (2).
7. Information carrier as claimed in one of the preceding Claims, **characterized in that** the information carrier comprises two substrate layers separated by a bonding agent, the substrate layers each supporting an information layer.

Patentansprüche

Patentansprüche für folgende Vertragsstaaten : BE, ES, GR, IT, NL, PT

1. Informationsträger mit einem Substrat und Informationsschichten, die optisch lesbare Effekte aufweisen, welche Effekte Informationen repräsentieren, wobei die Informationsschichten eine Standardschicht (2) umfassen, die Effekte mit einer Standardinformationsdichte aufweist, die mit einem optischen Strahlenbündel (8), das von Licht einer ersten Wellenlänge gebildet wird, lesbar sind, wobei das Strahlenbündel, beim Auslesen, an einer Eintrittsseite des Substrats eintritt, wobei die Standardschicht (2) gegenüber der Eintrittsseite liegt, und mit einer Schicht (3) hoher Dichte, die Effekte mit hoher Informationsdichte aufweist, wobei die

Schicht (3) hoher Dichte für das optische Strahlenbündel (8) der ersten Wellenlänge nahezu transparent ist, wobei die Schicht (3) hoher Dichte zumindest teilweise für Licht (9) einer zweiten Wellenlänge, das zum Auslesen von Effekten mit hoher Informationsdichte geeignet ist, reflektierend ist, **dadurch gekennzeichnet, dass** der Abstand zwischen der Schicht (3) hoher Dichte und der Eintrittsseite nahezu gleich dem halben oder kleiner als der Abstand zwischen der Standardschicht (2) und der Eintrittsseite ist.

2. Informationsträger nach Anspruch 1, **dadurch gekennzeichnet, dass** der Abstand zwischen der Standardschicht (2) und der Eintrittsseite etwa 1,2 mm beträgt.
3. Informationsträger nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Schicht (3) hoher Dichte für Licht der zweiten Wellenlänge, das ein Abtasten der Standardschicht (2) ermöglicht, teildurchlässig ist.
4. Informationsträger nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Schicht (3) hoher Dichte nahezu vollständig für Licht der zweiten Wellenlänge reflektierend ist.
5. Informationsträger nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Schicht (3) hoher Dichte unter anderem die gleiche Information wie die Standardschicht (2) beherbergt.
6. Informationsträger nach Anspruch 1, 2, 3, 4 oder 5, **dadurch gekennzeichnet, dass** die Schicht (3) hoher Dichte in der Standardschicht (2) aufgezeichnete Information beherbergt, welche Information anders codiert ist als die Information in der Standardschicht (2).
7. Informationsträger nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Informationsträger zwei Substratschichten umfasst, die durch ein Haftmittel getrennt sind, wobei die Substratschichten je eine Informationsschicht tragen.

Patentansprüche für folgenden Vertragsstaat : DE

1. Informationsträger mit einem Substrat und Informationsschichten, die optisch lesbare Effekte aufweisen, welche Effekte Informationen repräsentieren, wobei die Informationsschichten eine Standardschicht (2) umfassen, die Effekte mit einer Standardinformationsdichte aufweist, die mit einem optischen Strahlenbündel (8), das von Licht einer er-

- sten Wellenlänge gebildet wird, lesbar sind, wobei das Strahlenbündel, beim Auslesen, an einer Eintrittsseite des Substrats eintritt, wobei die Standardschicht (2) gegenüber der Eintrittsseite liegt, und mit einer Schicht (3) hoher Dichte, die Effekte mit hoher Informationsdichte aufweist, wobei die Schicht (3) hoher Dichte für das optische Strahlenbündel (8) der ersten Wellenlänge nahezu transparent ist, wobei die Schicht (3) hoher Dichte zumindest teilweise für Licht (9) einer zweiten Wellenlänge, das zum Auslesen von Effekten mit hoher Informationsdichte geeignet ist, reflektierend ist, wobei der Abstand zwischen der Schicht (3) hoher Dichte und der Eintrittsseite nahezu gleich dem halben oder kleiner als der Abstand zwischen der Standardschicht (2) und der Eintrittsseite ist, **dadurch gekennzeichnet, dass** die Schicht (3) hoher Dichte eine Surround-Sound-Version von auch in der Standardschicht (2) aufgezeichneter Information beherbergt.
2. Informationsträger nach Anspruch 1, **dadurch gekennzeichnet, dass** der Abstand zwischen der Standardschicht und der Eintrittsseite etwa 1,2 mm beträgt.
 3. Informationsträger nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Schicht (3) hoher Dichte für Licht der zweiten Wellenlänge, das ein Abtasten der Standardschicht (2) ermöglicht, teildurchlässig ist.
 4. Informationsträger nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Schicht (3) hoher Dichte nahezu vollständig für Licht der zweiten Wellenlänge reflektierend ist.
 5. Informationsträger nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Schicht (3) hoher Dichte unter anderem die gleiche Information wie die Standardschicht (2) beherbergt.
 6. Informationsträger nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Informationsträger zwei Substratschichten umfasst, die durch ein Haftmittel getrennt sind, wobei die Substratschichten je eine Informationsschicht tragen.
- Patentansprüche für folgende Vertragsstaaten : FR, GB**
1. Informationsträger mit einem Substrat und Informationsschichten, die optisch lesbare Effekte aufweisen, welche Effekte Informationen repräsentieren, wobei die Informationsschichten eine Standard-

schicht (2) umfassen, die Effekte mit einer Standardinformationsdichte aufweist, die mit einem optischen Strahlenbündel (8), das von Licht einer ersten Wellenlänge gebildet wird, lesbar sind, wobei das Strahlenbündel, beim Auslesen, an einer Eintrittsseite des Substrats eintritt, wobei die Standardschicht (2) gegenüber der Eintrittsseite liegt, und mit einer Schicht (3) hoher Dichte, die Effekte mit hoher Informationsdichte aufweist, wobei die Schicht (3) hoher Dichte für das optische Strahlenbündel (8) der ersten Wellenlänge nahezu transparent ist, wobei die Schicht (3) hoher Dichte zumindest teilweise für Licht (9) einer zweiten Wellenlänge, das zum Auslesen von Effekten mit hoher Informationsdichte geeignet ist, reflektierend ist, wobei der Abstand zwischen der Schicht (3) hoher Dichte und der Eintrittsseite nahezu gleich dem halben oder kleiner als der Abstand zwischen der Standardschicht (2) und der Eintrittsseite ist, **dadurch gekennzeichnet, dass** die Schicht (3) hoher Dichte unter anderen Dingen die gleiche Information wie die Standardschicht (2) beherbergt, wobei die anderen Dinge Erweiterungen für die genannte gleiche Information umfassen.

2. Informationsträger nach Anspruch 1, **dadurch gekennzeichnet, dass** die genannten Erweiterungen eine Surround-Sound-Version von auch in der Standardschicht (2) aufgezeichneter Information umfassen.
3. Informationsträger nach Anspruch 1, **dadurch gekennzeichnet, dass** der Abstand zwischen der Standardschicht und der Eintrittsseite etwa 1,2 mm beträgt.
4. Informationsträger nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Schicht (3) hoher Dichte für Licht der zweiten Wellenlänge, das ein Abtasten der Standardschicht (2) ermöglicht, teildurchlässig ist.
5. Informationsträger nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Schicht (3) hoher Dichte nahezu vollständig für Licht der zweiten Wellenlänge reflektierend ist.
6. Informationsträger nach Anspruch 1, 2, 3, 4 oder 5, **dadurch gekennzeichnet, dass** die Schicht (3) hoher Dichte in der Standardschicht (2) aufgezeichnete Information beherbergt, welche Information anders codiert ist als die Information in der Standardschicht (2).

7. Informationsträger nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Informationsträger zwei Substratschichten umfasst, die durch ein Haftmittel getrennt sind, wobei

die Substratschichten je eine Informationsschicht tragen.

Revendications

Revendications pour les Etats contractants suivants : BE, ES, GR, IT, NL, PT

1. Support d'information comprenant un substrat et des couches d'information présentant des effets lisibles par voie optique, lesquels effets représentent de l'information, lesquelles couches d'information comprennent une couche standard (2) présentant des effets de densité d'information standard lisibles par un faisceau optique (8) formé par de la lumière d'une première longueur d'onde, le faisceau entrant dans un côté d'entrée du substrat pendant la lecture, la couche standard (2) étant située en face du côté d'entrée, et une couche à haute densité (3) présentant des effets de densité d'information élevés, la couche à haute densité (3) étant pratiquement transparente au faisceau optique (8) de la première longueur d'onde, la couche à haute densité (3) étant au moins partiellement réfléchissante pour la lumière (9) d'une deuxième longueur d'onde appropriée à la lecture d'effets de densité d'information élevée, **caractérisé en ce que** la distance comprise entre la couche à haute densité (3) et le côté d'entrée est pratiquement égale à la moitié de ou moins que la distance comprise entre la couche standard (2) et le côté d'entrée.
2. Support d'information selon la revendication 1, **caractérisé en ce que** la distance comprise entre la couche standard (2) et le côté d'entrée est d'environ 1,2 mm.
3. Support d'information selon la revendication 1 ou 2, **caractérisé en ce que** la couche à haute densité (3) transmet partiellement la lumière présentant la deuxième longueur d'onde et permettant le balayage de la couche standard (2).
4. Support d'information selon la revendication 1 ou 2, **caractérisé en ce que** la couche à haute densité (3) est pratiquement complètement réfléchissante pour la lumière présentant la deuxième longueur d'onde.
5. Support d'information selon l'une des revendications précédentes, **caractérisé en ce que** la couche à haute densité (3) contient, parmi d'autres choses, la même information que la couche standard (2).
6. Support d'information selon la revendication 1, 2, 3, 4 ou 5, **caractérisé en ce que** la couche à haute

densité (3) contient de l'information enregistrée dans la couche standard (2), laquelle information est codée différemment de l'information présente dans la couche standard (2).

7. Support d'information selon l'une des revendications précédentes, **caractérisé en ce que** le support d'information comprend deux couches de substrat séparées par un adhésif, les couches de substrat supportant chacune une couche d'information.

Revendications pour l'Etat contractant suivant : DE

1. Support d'information comprenant un substrat et des couches d'information présentant des effets lisibles par voie optique, lesquels effets représentent de l'information, lesquelles couches d'information comprennent une couche standard (2) présentant des effets de densité d'information standard lisibles par un faisceau optique (8) formé par de la lumière d'une première longueur d'onde, le faisceau entrant dans un côté d'entrée du substrat pendant la lecture, la couche standard (2) étant située en face du côté d'entrée, et une couche à haute densité (3) présentant des effets de densité d'information élevés, la couche à haute densité (3) étant pratiquement transparente au faisceau optique (8) de la première longueur d'onde, la couche à haute densité (3) étant au moins partiellement réfléchissante pour la lumière (9) d'une deuxième longueur d'onde appropriée à la lecture d'effets de densité d'information élevée, la distance comprise entre la couche à haute densité (3) et le côté d'entrée est pratiquement égale à la moitié de ou moins que la distance comprise entre la couche standard (2) et le côté d'entrée, **caractérisé en ce que** la couche à haute densité (3) contient une version sonore entourante d'information enregistrée également dans la couche standard (2).
2. Support d'information selon la revendication 1, **caractérisé en ce que** la distance comprise entre la couche standard (2) et le côté d'entrée est d'environ 1,2 mm.
3. Support d'information selon la revendication 1 ou 2, **caractérisé en ce que** la couche à haute densité (3) transmet partiellement la lumière présentant la deuxième longueur d'onde et permettant le balayage de la couche standard (2).
4. Support d'information selon la revendication 1 ou 2, **caractérisé en ce que** la couche à haute densité (3) est pratiquement complètement réfléchissante pour la lumière présentant la deuxième longueur d'onde.

5. Support d'information selon l'une des revendications précédentes, **caractérisé en ce que** la couche à haute densité (3) contient, parmi d'autres choses, la même information que la couche standard (2).
6. Support d'information selon l'une des revendications précédentes, **caractérisé en ce que** le support d'information comprend deux couches de substrat séparées par un adhésif, les couches de substrat supportant chacune une couche d'information.

Revendications pour les Etats contractants suivants : FR, GB

1. Support d'information comprenant un substrat et des couches d'information présentant des effets lisibles par voie optique, lesquels effets représentent de l'information, lesquelles couches d'information comprennent une couche standard (2) présentant des effets de densité d'information standard lisibles par un faisceau optique (8) formé par de la lumière d'une première longueur d'onde, le faisceau entrant dans un côté d'entrée du substrat pendant la lecture, la couche standard (2) étant située en face du côté d'entrée, et une couche à haute densité (3) présentant des effets de densité d'information élevés, la couche à haute densité (3) étant pratiquement transparente au faisceau optique (8) de la première longueur d'onde, la couche à haute densité (3) étant au moins partiellement réfléchissante pour la lumière (9) d'une deuxième longueur d'onde appropriée à la lecture d'effets de densité d'information élevée, la distance comprise entre la couche à haute densité (3) et le côté d'entrée étant pratiquement égale à la moitié de ou moins que la distance comprise entre la couche standard (2) et le côté d'entrée, **caractérisé en ce que** la couche à haute densité (3) contient, parmi d'autres choses, la même information que la couche standard (2), les autres choses comprenant des extensions de ladite même information.
2. Support d'information selon la revendication 1, **caractérisé en ce que** lesdites extensions comprennent une version sonore entourante d'information enregistrée également dans la couche standard (2).
3. Support d'information selon la revendication 1 ou 2, **caractérisé en ce que** la distance comprise entre la couche standard (2) et le côté d'entrée est d'environ 1,2 mm.
4. Support d'information selon la revendication 1 ou 2, **caractérisé en ce que** la couche à haute densité

(3) transmet partiellement la lumière présentant la deuxième longueur d'onde et permettant le balayage de la couche standard (2).

5. Support d'information selon la revendication 1 ou 2, **caractérisé en ce que** la couche à haute densité (3) est pratiquement complètement réfléchissante pour la lumière présentant la deuxième longueur d'onde.
6. Support d'information selon l'une des revendications précédentes, **caractérisé en ce que** la couche à haute densité (3) contient de l'information enregistrée dans la couche standard (2), laquelle information est codée différemment de l'information présente dans la couche standard (2).
7. Support d'information selon l'une des revendications précédentes, **caractérisé en ce que** le support d'information comprend deux couches de substrat séparées par un adhésif, les couches de substrat supportant chacune une couche d'information.

